

The Role of Friends in Adolescent Overweight and Weight-Related Behaviors:

A social network perspective

Kayla de la Haye, BA, BHSc (Hons)

School of Psychology, University of Adelaide

A thesis submitted in fulfillment of the requirements for the degree of

Doctor of Philosophy

October, 2010

TABLE OF CONTENTS

| | | |
|-----------|--|-------|
| Chapter 1 | Introduction and Literature Review | p.1 |
| Chapter 2 | Methodological Considerations and Statistical Models | p.31 |
| Chapter 3 | Exegesis | p.54 |
| Chapter 4 | Paper 1: <i>Weight similarities amongst adolescent friends: Homophily or contagion?</i> | p.63 |
| Chapter 5 | Paper 2: <i>Integration or marginalization. The importance of class norms in friendship relations of overweight children</i> | p.85 |
| Chapter 6 | Paper 3: <i>Obesity-related behaviors in adolescent friendship networks</i> | p.104 |
| Chapter 7 | Paper 4: <i>How physical activity shapes, and is shaped by, adolescent friendships</i> | p.130 |
| Chapter 8 | Conclusions, Implications, and Future Directions | p.164 |
| | References | p.191 |
| | Appendix A: Paper 3 Reprint | |

SUMMARY

This thesis examined processes that may be driving the clustering and proposed “spread” of obesity amongst adolescent friends and within their wider friendship networks (Fowler & Christakis, 2008; Halliday & Kwak, 2009). Specifically, the aims were to determine 1) if similarities in weight status amongst friends were explained, at least to some extent, by their body mass indexes (BMIs) assimilating over time, and 2) whether this was underpinned by friends’ influence on obesity-related behaviors. Findings from two cross-sectional studies and one longitudinal study are presented in four papers, of which one has been published and the remaining three submitted for publication.

Paper 1 examined associations between adolescents’ BMI and their school-based friendships longitudinally ($N = 156$), using stochastic actor-oriented models (SAOM) for social networks (Snijders, Steglich, & Schweinberger, 2007). Weight status was found to play a significant role in adolescents’ friendship choices, with overweight youth often marginalized by, and segregated from, their nonoverweight peers. Although there was a trend for friends’ BMIs to assimilate over the 16-month study, this effect was *not* statistically significant. Similarities in BMI amongst friends were therefore explained by friendship choices rather than “contagion” effects.

The conditions under which overweight youth are marginalized by their peers were further explored in Paper 2. This study looked at the role of school classroom norms favoring healthiness, and specifically the norms endorsed by high-status students, in weight-related marginalization amongst pre-adolescents. In this cross-sectional study ($N = 503$), exponential random graph models (ERGM) (Robins, Pattison, Kalish, & Lusher, 2007) were used to test for associations between weight status and friendships in school classes with

weak versus strong health norms. Overweight students, and particularly overweight girls, were found to be marginalized by their peers in classes with strong health norms; however overweight youth were well integrated in classrooms lacking clear norms on healthiness. The results suggest that local norms may impact the relevance of attributes like weight status to adolescent friendships and thus the prevalence of weight-based stigma in peer groups, providing some useful insights for future interventions.

Whether weight-related health behaviors clustered and spread amongst adolescent friends was investigated in the final two papers. The first, cross-sectional, study (Paper 3) looked at several obesity-related behaviors within three adolescent friendship networks ($N = 385$) and tested for similarities amongst friends using ERGMs. The strongest evidence of behavioral similarity was found for organized physical activity (PA); therefore the final paper (Paper 4) longitudinally examined the social processes driving this association using SAOMs ($N = 378$). Similarities in PA amongst friends over their first year of high school were found to be explained by friendship selection *and* influence: adolescents were likely to befriend peers whose attitudes towards PA, and engagement in PA, were similar to their own; and adolescents subsequently emulated their friends' behaviors so that friends' participation in PA became increasingly alike. Friends' influence on PA was not found to be mediated via adolescents' beliefs about PA, including their perceptions of peer norms, suggesting that this influence process was less internalized than some health behavior theories would suggest (e.g., Ajzen, 1991).

As a whole, the studies presented in this thesis suggest that the clustering of overweight in adolescent friendship networks is initially driven by processes of weight-based friendship selection and the marginalization of overweight adolescents by their peers. Excess weight was not found to be contagious in the short term, and longer studies applying

similar methods are needed. Nonetheless, some obesity-related behaviors were found to cluster in friendship networks, and for PA this was partially explained by adolescents adopting their friends' behaviors. Friends' influence on adolescent PA, and potentially other obesity-related behaviors, is a plausible mechanism that could result in the contagion of obesity in the longer-term. Intervening in, and potentially harnessing these social processes, provides a means to foster peer contexts that encourage healthy behaviors and help to reduce young people's obesity risk in future.

THESIS DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution to myself, Kayla de la Haye, and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

I acknowledge that copyright of published works contained within this thesis (as listed below) resides with the copyright holder(s) of those works.

I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library catalogue, the Australasian Digital Theses Program (ADTP), and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

de la Haye, K., Robins, G., Mohr, P., & Wilson, C. (2010). Obesity-related behaviors in adolescent friendship networks. *Social Networks*, 32 (3), 161-167.

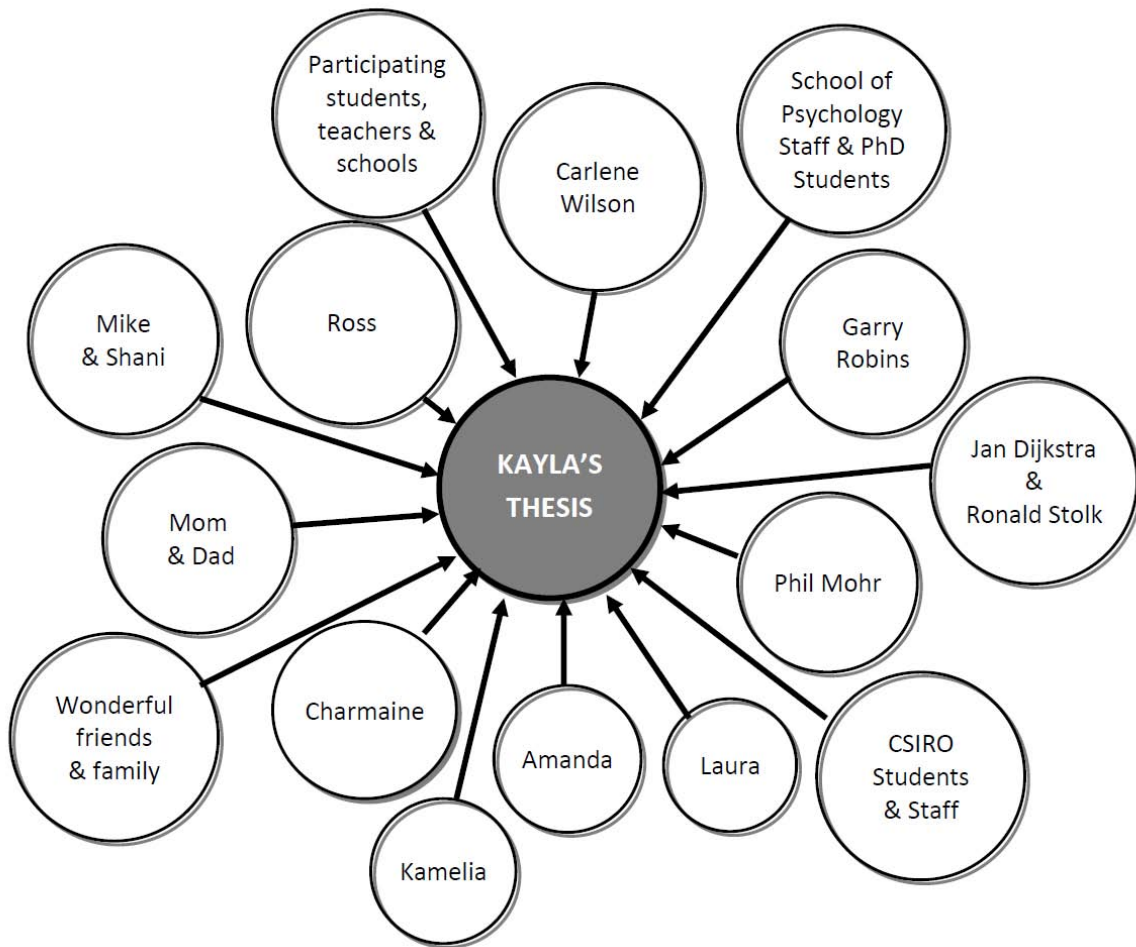
Kayla de la Haye

Signed: _____

Date: _____

ACKNOWLEDGEMENTS

Each and every person in my support network, thank you.



I would also like to gratefully acknowledge the financial support I received from the CSIRO Preventative Health Flagship and the University of Adelaide.